

PATENT
TH0681 04 (US)
DFH:EM

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of)	
)	
DAVID M. SINGLETON, LOUIS KRAVETZ,)	
BRENDAN D. MURRAY)	
)	
Serial No. 11/748,976)	Group Art Unit: 1796
)	
Filed May 15, 2007)	Examiner: Necholus Ogden Jr.
)	
HIGHLY BRANCHED PRIMARY ALCOHOL)	November 5, 2008
COMPOSITIONS, AND BIODEGRADABLE)	
<u>DETERGENTS MADE THEREFROM</u>)	

COMMISSIONER FOR PATENTS
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

DECLARATION UNDER RULE 132

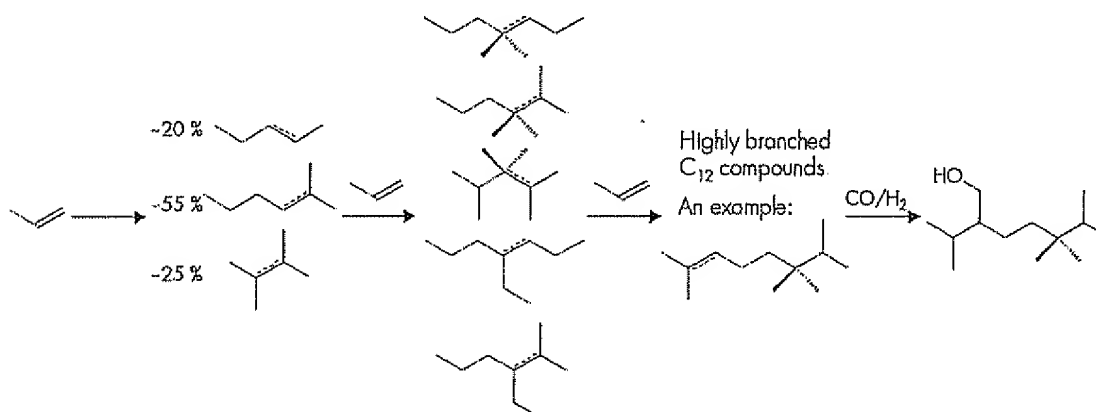
William Warren Schmidt hereby declares:

THAT he received an A.B. in Chemistry from the University of Tennessee at Chattanooga, Magna Cum Laude, in 1967; and that he received his M.S. Degree in Chemistry in 1969 from the University of Tennessee; and he received his PhD in Organic Chemistry from the University of Tennessee at Knoxville in 1975; and

THAT he has been employed by Shell Oil Company or one of its related companies since 1987 and has worked in the areas of the structure/property relationships of surfactants, the utility of alcohol-based surfactants, especially as detergent structures changed, the formulation of liquid detergents, the investigation of the detergency of alcohol ethoxylates, and the utility of alternate hydrophiles for surfactants; and

THAT, as described by Grifo, U.S. Patent No. 2,766,212, column 2, lines 9-13, the alcohols were prepared using the "oxo process" starting with olefins such as the "tetrapropylene" that was used to prepare the oxo tridecyl alcohol used in the examples; and

THAT the reaction sequence below depicts how such olefins, specifically tetrapropylene, were prepared in 1956 and displays representative structures; and that in the absence of comment or teaching, the catalyst for the olefin production is presumed to be an acid as described in Chemistry of Organic Compounds, 3rd Edition, by Noller, 1965, pp. 102-103 which describes olefin self-addition (see the bottom of p. 102 for mention of propylene tetramer); and



propene (I) → dimers (II) → trimers (III) → tetramers (IV) → isotridecanols (V)

THAT the dimers (II) will be approximately 80% branched and 20% linear and when the next propene is added, a very complex mixture (III), with little, if any, residual linear olefin is formed (five of the many possible structures are shown and three of the five structures have a quaternary carbon); and with the addition of the fourth propene, a complex mixture of greater than twenty olefins (IV), many of which have a quaternary carbon, is formed (only one of these has been drawn, a tri-methyloctene with a quaternary carbon); and that the use of an acidic catalyst facilitates alkyl group migration, thus increasing the number of isomers and the complexity of the structures; and

THAT the oxo reaction (V) with carbon monoxide and hydrogen yields a similarly complex mixture of alcohols which will also contain quaternary carbons (again only one of many possible isomers has been depicted); and

~~THAT the oxo tridecyl alcohols made by Grifo would have been comprised of many~~
isomeric structures, a substantial number of which would have had quaternary carbon atoms and
that the mixture would have had much more than 0.5 atom percent of quaternary carbon atoms; and
that the oxo tridecyl alcohols would have exhibited poor biodegradability.

William Warren Schmidt further declares that all statements herein of my own
knowledge are true and that all statements made on information and belief are believed to be true;
and further that these statements were made with the knowledge that willful false statements and
the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of
the United States Code and that such willful false statements may jeopardize the validity of the
application or any patent issued thereon.

Date November 5, 2008

William Warren Schmidt
William Warren Schmidt

3rd Edition

CHEMISTRY
of
ORGANIC
COMPOUNDS

CARL R. NOLLER

Professor of Chemistry, Stanford University

W. B. SAUNDERS COMPANY
Philadelphia and London

1965

